filling [the open cells of] each of said open-celled pores of said metal foam with said resin component; [and]

converting said resin component, within each of said [cells] open-celled pores, to a bulk solid, non-elastomeric acoustically-damping polymerized resin [,thus forming a composite comprising a matrix of said non-elastomeric polymerized resin, said matrix having therein said metal foam,]; and

forming an acoustically-damping composite article.

REMARKS

Reconsideration of the application in view of the above amendments and following remarks is requested.

Claims 1- 22 are pending in the present application. No claim has been canceled. Claims 5, 6, 8-10,and 12-16 have been withdrawn from consideration by the patent examiner as being directed to non-elected species. By present amendment, independent claims 1, 21, and 22 are amended to more specifically define Applicants' invention. Dependent claims 2-4, 7, 11, 17-19 have been amended.

The patent examiner, Office Action, mailed on August 25, 1999, has rejected claims 1-4,7,11,19 and 22 under 35 U.S.C § 102(b) as being anticipated by Tsang et al. (US 4,605,595). The patent examiner has stated that "Tsang discloses that suitable binders include epoxy resins and phenolic resins."

Claim 1 had been amended to recite:

An acoustically damping composite article, comprising a metal body having open-celled pores in both an upper and a lower portion of said metal body, wherein each of said open-celled pores is completely filled with a solid bulk, non-elastomeric acoustically-damping polymer matrix.

Claim 22 has been amended to recite:

A method of forming an acoustically damping composite article comprising the steps of:

impregnating a metal foam, wherein said metal foam having open-celled pores throughout,with a resin component so as to completely penetrate each of said open-celled pores of said metal foam and completely filling each of said open-celled pores of said metal foam with said resin component;

converting said resin component, within each of said open-celled pores, to a bulk solid, non-elastomeric acoustically-damping polymerized resin; and

forming an acoustically-damping composite article.

Support can be found at page 3, lines 4 and 5, page 3, lines 21 and 22, page 5, line 25, page 2, line 24, page 9, lines 8 and 9, page 8, lines 12-14 and page 15, lines 12 and 13.

Tsang et al. relates to a "friction article", i.e., a brake pad. The Tsang et al. invention was developed in order to find a substitute for asbestos, a reinforcing fiber, as asbestos was considered a health hazard. See, Col. 1, lines 27 - 34. Claim 1 of

Tsang et al. requires that the open foam, which is the first three-dimensional matrix, and the slurry plus additives, i.e., fillers and friction modifiers, which will upon curing becomes the second three dimensional matrix be "distinct and functionally independent to withstand stresses experienced during a brake application."

The present invention relates to a composite that is an acoustically damping material.

In the present application, it is stated on page 12, lines 1 - 5 that:

> The interaction of the metal foam and the polymer matrix also contributes to the structural strength of the composite. Consequently, the structural strength of the metal foam/polymer composite is greater than the individual structural strengths of the metal foam and the polymer.

Synergism is defined as "the interaction of elements that when combined produce a total effect that is greater than the sum of the individual elements, contributions, etc." Random House Webster's College Dictionary, 1997. The two (2) elements , metal foam and polymer, of the present invention, composite, are synergistic, i.e., working together. This is clearly not the case in Tsang et al. and is clearly not desirable.

Tsang et al. and the present invention are entirely different inventions solving entirely different problems. One invention cannot be substituted for the other and Tsang et al. does not anticipate the present invention. The invention of Tsang et al. must have fillers, and friction modifiers.

As claims 2-4, 11, and 19 contain all the limitations of claim 1, it is felt to distinguish from the references in the same manner as claim 1.

The patent examiner rejected claims 1-4,7, 19 and 22 as anticipated by or, in the alternative, under 35 U.S.C § 103(a) as obvious over Reitz (US 4,759,000). Reitz discloses the claimed invention except for literally disclosing that the metal foam is an open celled foam. It appears that the foam must inherently be an open cell foam because the pores of the foam are filled with impregnate, Col. 9, lines 67 to Col. 10, line 11. Reitz also discloses a harden silicone rubber, which reads on the applicants' definition of a non-elastomeric polymer matrix.

Claim 1 has been amended to recite:

An acoustically dampening composite article, comprising a metal body having open-celled pores in both an upper and lower portion of said metal body, wherein each of said open-celled pores is completely filled with a solid bulk, non-elastomeric acoustically-damping polymer matrix.

Claim 22 has been amended to recite:

A method of forming an acoustically damping composite comprising the steps of:

impregnating a metal foam, wherein said metal foam having open-celled pores throughout, with a resin component so as to completely penetrate each of said open-celled pores of said metal

foam and completely filling each of said open-celled pores of said metal foam with said resin component;

converting said resin component, within each of said open-celled pores, to a bulk solid, non-elastomeric acoustically-damping polymerized resin; and

forming an acoustically-damping composite article.

Reitz relates to acoustic energy absorbing baffle. Housing sheet 61 is a porous metal foam, e.g., aluminum-nickel, impregnated with rubber. It is formed by dipping the metal foam into uncured rubber and then curing the rubber. It is stated at Col. 10, lines 3 - 4 that:

> It is not, in this present embodiment and acoustically absorptive material such as the RTV silicone rubber as taught in U.S. Patent No. 4,528,652.

It is stated at Col. 10, lines 8 and 9 that:

It [sheet 61] merely serves as an acoustic window for frequencies of acoustic energy (underwater) of 29 kHz and below.

This means that frequencies of acoustic energy of 29 kHz and below pass through.

It is stated at Col. 10, line 12 that:

Care must be taken to ensure that sheet 61 is watertight.

Claims 1 and 22 as amended require that the imbibed polymer matrix be "acoustically-damping."

Thus, Reitz does not anticipate the present invention. In

fact, Reitz teaches away from the present invention. Therefore, Reitz does not make the present invention obvious.

As claims 2-4, 7, and 19 contain all the limitations of claim 1, it is felt to distinguish from the references in the same manner as claim 1.

The patent examiner rejected claims 17, 18, 20 and 21 under 35 U.S.C. § 103(a) as being unpatentable over any of Fisher, Tsang et al. or Reitz. The patent examiner stated that:

> With regard to claims 17 and 18, none of Fisher, Tsang and Reitz specifically disclose the pore size relationship of the pores of the metal foam. However, it is well known in the art that the pore size distribution directly effects the properties of the foam. It would have been within the level of ordinary skill in the art to have used a uniform pore sized foam, motivated by the desire to obtain a foam having substantially uniform properties along the entire length of the foam. Likewise, it would have been obvious to the skilled artisan to have used a gradation pore size foam, motivated by the desire to obtain a foam having differing properties along the length of the foam.

Independent claim 21 has been amended to recite:

21. An acoustically damping composite article, comprising a metal body having open-celled pores in both an upper and a lower portion of said metal body, wherein each of said open-celled pores

is completely filled with a solid bulk, non-elastomeric acoustically-damping polymer matrix, and wherein said metal body has a thickness no less than 3 times the average diameter of said pores.

There is no suggestion or teaching in the cited art with regard to the thickness of the metal body. Claim 21 is patentable over the cited art based on applicants' above-discussion.

Claims 17, 18 and 20 contain all the limitations of claim 1, it is felt to distinguish from the references in the same manner as claim 1.

The test of Section 103 is not whether an improvement or a use is set forth in a patent would have been obvious or nonobvious; rather the test is whether the claimed invention, considered as a whole would have been obvious. Jones v. Hardy, 110 U.S.P.Q. 1021, 1024 (Fed. Cir 1984). Thus, it is impermissible to focus either on the "gist" or "core" of the invention, Bausch & Lomb, Inv. v. Barnes-Hind/Hydrocurve, Inc., 230 U.S.P.Q. 410, 420 (Fed. Cir. 1986), or on specific differences between the claimed invention and the prior art, Jones, at 220 U.S. P.Q. at 1024. Moreover, the invention as a whole is not restricted to the specific subject matter claimed, but also embraces its properties and the problems it solves, In re Wright, 6 U.S.P.Q. 2d 1959, 1961 (Fed. Cir. 1988).

Similarly, the references must be taken in their entireties,

including those portions which argue against obviousness, Bausch & Lomb, U.S.P.Q. at 420. It is impossible within the framework of Section 103 to pick and choose from a reference only so much of it as will support a conclusion of obviousness to the exclusion of other parts necessary to a full appreciation of what the reference fairly suggests to one skilled in the art. Id. at 419. The courts have long cautioned that consideration must be given "where the references diverge and teach away from the claimed invention." Akzo N.V. v. International Trade Commission, 1 U.S.P.Q. 2d 1241, 1246 (Fed. Cir. 1986).

Kindly charge any additional fees due, or credit overpayment of fees, to Deposit Account No. 50-0281.

In view of the foregoing it is submitted that this application is now in condition for allowance.

Respectfully submitted,

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